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RELATIONSHIP OF MOTHERS' LANGUAGE STYLES TO THE COGNITIVE STYLES OF URBAN PRE-SCHOOL CHILDREN.

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DESCRIPTORS- COGNITIVE MEASUREMENT, COGNITIVE TESTS, *COGNITIVE DEVELOPMENT, *LANGUAGE STYLES, PRESCHOOL CHILDREN, URBAN LANGUAGE, CHILD DEVELOPMENT, ECONOMICALLY DISADVANTAGED, CULTURALLY DISADVANTAGED, *NEGRO MOTHERS, MIDDLE CLASS, LOWER CLASS, *VERBAL ABILITY, CULTURALLY ADVANTAGED, INTELLIGENCE QUOTIENT, SOCIOLINGUISTICS, PSYCHOLINGUISTICS,

THERE IS GROWING EVIDENCE THAT THE PROCESS OF EDUCATIONAL RETARDATION WHICH HAS BEEN OBSERVED IN MANY CHILDREN FROM ECONOMICALLY DEPRESSED AREAS SETS IN LONG BEFORE THE CHILDREN ENTER THE FIRST GRADE. THIS STUDY WAS DESIGNED TO EXAMINE THE RELATIONSHIP BETWEEN MATERNAL LANGUAGE STYLES AND PRE-SCHOOL CHILDREN'S COGNITIVE STYLES AND INTELLECTUAL COMPETENCE LEVELS, SPECIFICALLY TO (1) DEVELOP LANGUAGE SCALES FOR THE ANALYSIS OF THE LANGUAGE STYLES OF NEGRO MOTHERS OF FOUR SOCIAL CLASS GROUPS, (2) ASSESS SOCIAL CLASS DIFFERENCES IN LANGUAGE STYLES, AND (3) APPRAISE THE RELATIONSHIP BETWEEN MOTHERS' LANGUAGE STYLES AND THEIR PRE-SCHOOL CHILDREN'S COGNITIVE STYLES AND INTELLECTUAL COMPETENCE LEVELS. SOME OF THE CONCLUSIONS AND IMPLICATIONS WERE--(1) SOCIAL CLASS LEVEL WAS A MAJOR PREDICTOR OF THE CHILDREN'S CONCEPTUAL SORTING BEHAVIOR IN ONLY ONE INSTANCE (DESCRIPTIVE PART-WHOLE CONCEPTUALIZATION). (2) THE MOTHER'S VERBAL IQ WAS A MAJOR PREDICTOR OF ONLY THE CRITERION VARIABLE, THE CHILD'S IQ. (3) WHERE THE CHILD'S OWN IQ WAS AN IMPORTANT FACTOR IN HIS CONCEPTUALIZING BEHAVIOR, THE MOTHER'S LANGUAGE WAS AT LEAST AS IMPORTANT, ALSO. (4) CHILDREN WHO WERE UNABLE TO EXPLAIN VERBALLY THE REASON FOR THEIR CONCEPTUAL SORTS TENDED TO BE LOW IN IQ AND TO HAVE LOW VERBAL IQ MOTHERS. ACCORDING TO THE AUTHOR THIS IS INDIRECT SUPPORT FOR THE VIEW THAT LANGUAGE MEDIATES THOUGHT. (5) CHILDREN WHO DID NOT PERFORM THE TASK TENDED TO BE LOW IN IQ AND TO HAVE MOTHERS WHO WERE LOW IN VERBAL IQ AS WELL AS IN VIRTUALLY ALL THE LANGUAGE MEASURES. THE AUTHOR FEELS THAT ONE OF THE MOST POSITIVE RESULTS OF THE STUDY MAY BE THAT A BEGINNING HAS BEEN MADE AT DISCOVERING THE PRECISE LANGUAGE MECHANISMS WHICH MEDIATE BETWEEN CULTURAL EXPERIENCE AND COGNITIVE BEHAVIOR AND DEVELOPMENT. THE STUDY SUGGESTS THAT PERHAPS ONE EFFECTIVE METHOD FOR ENHANCING THE COGNITIVE DEVELOPMENT OF THE CULTURALLY DISADVANTAGED CHILD IS TO TAKE STEPS IN THE PRE-SCHOOL YEARS TO EXPAND HIS LINGUISTIC ENVIRONMENT AND TO ENCOURAGE HIM TO SEE THE VALUE, INTRINSIC AS WELL AS EXTRINSIC, OF USING LANGUAGE AS A COGNITIVE TOOL. (SEE RELATED DOCUMENT ED 012 282.) (AMM)

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BACKGROUND

There is growing evidence that the process of educational retardation which has been observed in many children from economically depressed areas sets in long before the children enter the first grade.[1] The situation is exacerbated by the increasing complexity of society. More and more, education for life in such a society demands that a high level of cognitive development be achieved by those who are to participate in that society. This means that individuals must develop highly skilled and elaborate methods of processing information and manipulating the environment symbolically. Children growing up in such a world not only must learn to want to learn, but they must also learn how to learn. The culturally disadvantaged child accumulates a severe deficit in social efficacy. This is bad enough. But an even greater disadvantage is that he is denied the opportunity for self-actualization, the opportunity to experience the power and the excitement that come with the development of symbol-using competence.

The matrix of cognitive procedures (structures, schemata) that the child develops is socialized and internalized during the course of early learning, particularly in interaction with significant others. In the pre-school years, this interaction is primarily with the mother. Since the development of cognitive processes in the child is mediated in the first instance by the language employed by the mother, it follows that the structure and complexity of the forms of language, and indirectly of thought, that are available to the child are determined in large measure by the structure and complexity of the mother's language.

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[1] Hess, R. D., Shipman, Virginia C., & Jackson, D. Early experience and the socialization of cognitive modes in children. Child Development, in press.

OBJECTIVES

Accordingly, it was decided to examine the relationship between maternal language styles and pre-school children's cognitive styles and intellectual competence levels. The specific aims of the study were:

1. To develop language scales for the analysis of the language styles of mothers of four social class groups.

2. To assess social class differences in language styles.

3. To appraise the relationship between mothers' language styles and their pre-school children's cognitive styles and intellectual competence levels.

PROCEDURE

Subjects

The subjects of this study are those who participated in the Cognitive Environments of Urban Pre-School Children project under the direction of Professor Robert D. Hess, Director, Urban Child Center, The University of Chicago. A research group of 163 mothers and their four-year old children was selected to provide variation along four dimensions: socio-economic background, type of housing, economic dependency status, and intactness of family. All subjects are Negroes, mothers were non-working, and subjects were free from any obvious mental or physical disabilities. The criteria for selection of sub-groups and the composition of each group are:

Group A (N = 40)

Occupational level of husband: professional, executive, managerial

Education: college attendance of mother and father; not necessarily a college degree

Housing: private

Economic status: no dependency on public assistance

Family structure: intact (i.e., father present in the home)

Group B (N = 42)

Occupational level of husband: skilled blue collar

Education: some high school, but not exceeding grade 12 (both parents)

Housing: one-half public housing; one-half private housing

Economic status: no dependency on public assistance for income

Family structure: intact

Group C (N = 40)

Occupational level of husband: unskilled or semi-skilled

Education: not beyond the 10th grade (both parents)

Housing: one-half public housing; one-half private housing

Economic status: no dependency for income

Family structure: intact

Group D (N = 41)

Occupational level of mother: unskilled or semi-skilled (last employment

Education: not exceeding 10th grade

Housing: one-half public housing; one-half private housing

Economic status: dependent on public assistance (aid to dependent children)

Family structure: father absent

In each group, mother-child pairs were selected to provide equal sex distribution of the children. Age of children ranged from 3 years 9 months to 4 years 4 months.

Data and Data-Gathering Procedures

The mothers were interviewed in the home and also brought to the Urban Child Center with their children. For the language style analysis, three samples of the mother's speech were obtained. In the home, she was asked by the interviewer to describe in detail a "typical day" in her life. The mother was also given two projective tests. In one, she was presented with a photograph of a mother and a teacher in a class room and was asked to tell what might be going on in the picture. In the other projective test, she was presented with Card No. 3, the "lion-mouse" card of the Children's Apperception Test, and was requested to tell a story about the picture to her child, who was present. The instructions were standard TAT instructions. All interviews and stories were tape-recorded.

In the Urban Child Center, the mother was administered the verbal sub-tests of the Wechsler Adult Intelligence Scale. The child was given the Stanford-Binet (Form L-M) and the Sigel Conceptual Sorting Task. In this task, the child is requested to select one of three pictures that is like, or goes with, a presentation picture. There are 20 sets of pictures, with a separate presentation picture for each set, so that the child is asked to make 20 selections. Five of the sets contain human figures and 15 contain animals and objects. The child is asked to name each object or figure placed before him on each trial. He is then directed to select the picture that goes with the presentation picture. Finally, he is asked to state the reason for his selection. Verbal responses are scored on the basis of the kind of concept expressed. Following is a description of the response categories:

Descriptive Part-Whole concepts are based on pairings of selected and presentation pictures where the basis of the concept is one of the manifest physical attributes or properties of the paired pictures, such as color (black and white only), texture, shading, shape, or size. This category also includes selections in which the concept is based on individual items or parts of figures in the pictures, such as guns, wheels, heads, legs, uniforms, posture, etc.

Descriptive Global concepts are based on some manifest global attribute of the selected pairing, such as sorts based on the status or occupation of the figures (policemen, soldiers, nurses, trucks, etc.); sorts in which discrete age categories are used (children, adults, babies, etc.); sorts based on sex (males, females); and sorts based on age and sex (young women, boys, girls).

Relational-Contextual concepts are based on an interdependence among two or more stimuli, the interdependence being of a functional, temporal, or spatial contiguity, e.g., "the horse pulls the stagecoach," "the man is shooting the other man dead." The relationship must be between the stimuli in the subject's pairing and not between the stimuli and any external factor introduced by the subject.

Categorical-Inferential concepts are based on inferred or non-observable characteristics of the paired stimuli. Each member of the pair is representative of the total class and each instance is not interdependent, e.g., "these are sick people," "they are good."

Because some children were unable to give scorable responses, additional categories were developed in the Cognitive Environments Project study and these additional categories were also used in the present study:

Non-Scorable Verbal Responses are verbal explanations of why the child made a particular selection where the scorer cannot place the response in one of the foregoing categories because it is unclear, ambiguous, irrelevant, or the like.

Nonverbal Responses are selections where the child gives no reply to the examiner's question regarding the basis of the selection, simply points at the pictures, says "don't know," or says, "this . . . that."

Non-Sorts include instances in which the child refused to do the task and instances in which the child failed to make a selection.

Analysis of Data

The language protocols were scored independently of the interviews and testing, by coders employed for the purpose. Coding was performed in accordance with a scoring manual for the language measures devised.

The language scales were factor analyzed to determine what language behaviors the scales were measuring and whether any of the scales overlapped.

Social class comparisons were then made, first, by a simple comparison of the means of each social class group for each language scale and for each of the three speech samples, and second, by means of the Mann-Whitney Test, which compares the relative location of the frequency distributions of two groups of subjects on a common scale.

To appraise the relationship between the mothers' language and their children's cognitive behavior, a series of regression analyses was undertaken. The criterion, or dependent, variables selected were the child's intellectual competence level, as measured by the Stanford-Binet, and responses to the Sigel Conceptual Sorting Task. The predictor, or independent, variables were the nine language scales, the

mothers' WAIS verbal IQs, social class level, and the children's IQs (except when the children's IQs were used as a criterion variable).

RESULTS

1. Nine language scales were developed for scoring the speech samples for lexical, syntactic, and cognitive complexity and elaboration:

(1) Mean sentence length is the average number of words per sentence. Sentences are marked off on the basis of the three kinds of signals by which the native speaker of English recognizes sentence divisions in spoken language: pitch, stress, and juncture (the joinings and pauses in the flow of an utterance). Where aberrations of intonation patterns created ambiguity of sentence demarcation, traditional definitions of a sentence were used supplementarily, such as that a sentence contains a complete thought or that a sentence contains a subject and a predicate.

(2) Verb elaboration is the number of complex verb types per sentence. The score is based on the number of complex verb types (excluding repetitions) divided by the number of sentences in the protocol to account for protocol length. A complex verb type is a verb containing more than one element in the verb stem or phrase, e.g., is going, has been done.

(3) Complex verb preference is the proportion of complex verb types (excluding repetitions) to the total verb types, both simple and complex. A simple verb is a verb of only one word (is, made).

(4) Adverb range scores are based on the number of uncommon adverbs (excluding repetitions) divided by the total number of verbs,

adjectives, and adverbs to adjust for protocol length. Uncommon adverbs excludes here, there, now, then, less, least, more, most, just, not, no, yes, how, when, where, and why.

(5) Adjective range scores are based on the number of uncommon adjectives (excluding repetitions) divided by the total number of nouns to adjust for protocol length. Uncommon adjectives excludes cardinal numerical, demonstrative, and pronominal possessive adjectives; the articles (a, an, the); other; and another.

(6) Syntactic structure elaboration is based on the number of complex syntactic structures, weighted according to their degree of complexity, and divided by the number of words in the protocol to adjust for length. Complex syntactic structures include (1) coordinate clauses; (2) subordinate clauses; (3) infinitive clauses; (4) sentence-modifying infinitive phrases (as distinguished from noun-modifying infinitive phrases); (5) infinitive phrases appearing in structures of complementation; (6) sentence-modifying participial phrases. The weighting system takes into account the degree to which syntactic structures are articulated with one another to form higher-order complex structures.

(7) Stimulus utilization scores consist of the number of characters (including parts and features of characters) and objects present in the projective test picture which the testee uses in the story he makes up.

(8) Introduced content scores consist of the number of characters (and parts and features of characters) and objects which are not present in the projective test picture but which are introduced by the testee in the story he makes up.

(9) Abstraction scores are based on the number of abstract nouns and verbs, excluding forms of be and repetitions, divided by the total nouns and verbs, including concrete nouns and verbs, but excluding forms of be and repetitions. A concept is abstract when it is thought of apart from cases in which it is actually experienced. When thought of as realized in objects and instances, a concept is concrete. E.g., animal is abstract in the sentence, "the lion is an animal," but concrete in the sentence, "the animal stalked his prey."

2. The nine language scales were factor analyzed together with the mothers' verbal IQs and social class level. The latter were included because of the possibility that the scales could be measuring what IQ tests measure and because of the possibility that social class level might be relevant. From the 11 variables in the matrix, factor analysis of the mothers' responses to the "lion-mouse" projective test yielded a set of 9 factors. The mothers' WAIS verbal IQs and social class level emerged as a factor, separate from the others. The 9 language scales, therefore, produced 8 language factors, 6 of which were unique. Verb elaboration appeared on a factor with mean sentence length and on a factor with complex verb preference.

Only 10 variables were used in the factor analysis of the responses to the mother-teacher picture. Scoring for abstraction was discontinued when it became evident that the mother-teacher task elicited very few abstract nouns and verbs. With the exception of an abstraction factor, the mother-teacher factor analysis yielded exactly the same set of factors as in the case of the lion-mouse stories. Factor analysis of the typical

day responses yielded results consistent with the previous analyses considering the fact that the typical day matrix did not include three language variables: abstraction, stimulus utilization, and introduced content--the last two being irrelevant since the typical day task is not a projective test.

It appears that discrete language factors can be extracted from a variety of speech samples and that, in the main, the language scales which were developed measure different dimensions of language behavior. Eight different aspects of language have been identified, indicating that the language scales provide viable measures of language behavior.

3. When the means of the four groups of mothers were compared on each of the nine language scales, using the lion-mouse speech sample, the middle class mothers were highest on all language scales; the upper lower class mothers were second highest on five scales (adverb range, verb elaboration, complex verb preference, introduced content, and abstraction); the lower lower class mothers were second highest on two scales (mean sentence length and syntactic structure elaboration); and the ADC mothers were second highest on two scales (adjective range and stimulus utilization).

Using the typical day protocols, the middle class mothers had the highest means on five of the six language scales pertinent to this task; the upper lower mothers were second highest on four scales (mean sentence length, verb elaboration, complex verb preference, and syntactic structure elaboration); the lower lower mothers were second highest on adjective range; and the ADC mothers were highest on adverb range but lowest on all the other scales. The inflation of the ADC adverb scores proved to be artifactual in this case. The adverb scores are derived by

dividing the number of uncommon adverb types by the total verbs, adjectives, and adverbs. For some reason, the number of verbs, adverbs, and adjectives used by the ADC mothers in the typical day accounts was disproportionately low, thereby producing artificially inflated ratios. (This is a risk one takes in using ratio scales to account for protocol length; so far as is known, this is the only instance of an artifactual result in this study.)

In the case of the mother-teacher protocols, the middle class mothers had the highest means in five of the eight pertinent scales, were second in adjective range and syntactic structure elaboration, and lowest in introduced content; the upper lower mothers were highest in adjective range and syntactic structure elaboration and second highest on the other scales; the lower lower class mothers were highest in introduced content, but otherwise in third or fourth position; and the ADC mothers were in third or fourth position on all scales. The unexpected reversal with respect to the introduced content scores is explicable on two grounds. First, the middle class mother tended to limit the introduction of characters and objects in this task because of her superiority in abstract attitude. When she saw the situation as problematic, she was likely to state that perhaps the child had a "behavior problem," and to stop with that generalization. The lower class mother, on the other hand, was more likely to say that perhaps the child hit another child (introduced character) or failed to do her homework (introduced object). Unable to generalize the situation, she resorted to explicit spelling out of what she meant. Second, the situation of a mother and a teacher conversing in a classroom is not a stimulus that especially aroused the middle

class mother. The lower class mother, however, was likely to perceive the situation as one in which the mother's child got into trouble and trouble seems to have elicited more story elaboration. By way of contrast, in the lion-mouse stories, the middle class mothers, who typically read and tell fanciful stories to their children, had the highest scores whereas the lower lower class mothers had the lowest scores.

4. More precise social group comparisons are afforded by the Mann-Whitney Test. Of all the scales, the mothers' mean sentence length was the most sensitive discriminator of social class differences in language. This is probably because sentence length, as a language factor, includes verb elaboration. The middle class mothers were superior to the mothers in the other three groups for all three speech samples at extraordinarily high levels of statistical significance. In the mother-teacher protocols, the upper lower class mothers were significantly superior to the lower lowers and ADC mothers. In the typical day accounts, the upper lower mothers were significantly superior to the ADC mothers.

Adjective range scores did not discriminate the groups at statistically significant levels in the lion-mouse and mother-teacher samples, though the results were in the predicted direction. In the typical day protocols, however, the middle class mothers were significantly superior to the other three groups.

Adverb range scores were more sensitive discriminators than adjective scores. In the lion-mouse stories, the middle class mothers were significantly superior to the lower lower and ADC mothers; in the mother-teacher stories, they were significantly superior to the lower lower class mothers. In the mother-teacher stories, also, the upper lower

mothers significantly exceeded the lower lower class mothers. In the typical day accounts, the ADC mothers were significantly superior to the upper lowers and the lower lowers, and had the direction been predicted, they would also have exceeded the middle class mothers at a statistically significant level. This finding corroborates the results previously reported with respect to group means (pp. 10-11).

Next to the mean sentence length scale, the verb elaboration scale was most sensitive to social class differences. In the lion-mouse and typical day speech samples, the middle class mothers significantly exceeded the other three groups; in the mother-teacher stories, they exceeded the lower lower and ADC groups significantly. In the mother-teacher stories, the upper lower class mothers, also, were significantly superior to the lower lower and ADC mothers. In the typical day protocols, both the upper lower and the lower lower class mothers were significantly superior to the ADC mothers.

In complex verb preference, the middle class mothers were significantly superior to the upper lower class mothers in the typical day accounts; to the lower lower class mothers in all three speech samples; and to the ADC mothers in the lion-mouse and typical day protocols. The upper lowers exceeded the lower lowers in the lion-mouse stories and the ADC mothers in the lion-mouse and the typical day protocols. The lower lowers exceeded the ADC mothers in the typical day accounts.

In syntactic structure elaboration, the middle class mothers were significantly superior to the other three groups in the lion-mouse stories; to the lower lower and ADC groups in the typical day accounts. The upper lowers were also significantly superior to the ADC mothers in the typical day accounts. In the mother-teacher stories, none of the

comparisons achieved statistical significance. This attenuation of social class group differences appears to be related to the social class level reversal in the introduced content scores (p. 11). The mother-teacher task seems to have elicited more syntactic elaboration on the part of lower class mothers than would customarily be the case.

The middle class mothers were significantly superior to the upper lowers and lower lowers in stimulus utilization with respect to their lion-mouse stories; in the mother-teacher stories, they significantly exceeded the upper lowers and ADC mothers.

With respect to introduced content, the middle class mothers were significantly superior to the lower lower class and ADC mothers in the case of the lion-mouse stories. They also would have been significantly superior to the upper lowers had the direction been predicted. In the mother-teacher stories, on the other hand, a social class reversal occurred (as previously noted in the discussion of means comparisons—pp. 11-12). The lower lower class mothers were significantly superior to the middle class mothers. The upper lower and ADC groups also exceeded the middles though not quite achieving conventional levels of statistical significance.

In abstraction (applicable only to the lion-mouse stories), the middle class mothers were significantly superior to the lower lowers and ADC mothers and the upper lowers significantly exceeded the ADC mothers.

5. To appraise the relationship between the mothers' language and their children's cognitive behavior, regression analyses were employed (see pp. 6-7). Because the results of the analyses are quite detailed

and complex, only the highlights are presented in this summary report.

Child's IQ

With the matrix of variables used, for the total sample the only variable significantly correlated with the children's Stanford-Binet IQs was the mothers' WAIS verbal IQs. Correlations for all three speech samples were significant beyond the .001 level. Correlations were much higher with the girls' IQs than with the boys' and these were all significant, also, beyond the .001 level. Mother-child IQ correlations were also significant for the upper lower and the ADC groups, but not for the other two social class groups. Five of the mothers' language scores were also significantly related to the children's IQs: mean sentence length (for the lower lowers in respect to the lion-mouse and mother-teacher stories); syntactic structure elaboration (lower lowers, lion-mouse stories); adjective range (middles, lion-mouse stories); adverb range (for the girls only, mother-teacher stories); verb elaboration, negatively related (boys, typical day protocols); and introduced content, negatively (girls only, mother-teacher stories).

Child's Categorical-Inferential Responses (Sigel Conceptual Sorting Task)

The categorical-inferential response requires abstraction behavior on the part of the child (see definition, p. 5). For the total sample, the only variable significantly correlated with the children's categorical-inferential responses was the mothers' language abstraction, significant beyond the .001 level. The correlation was also significant for the boys' responses, not the girls', and also for the middle class group. Moreover, it is the mother's abstract language, not her abstraction ability, that was related to the child's abstraction behavior.

Child's Descriptive Part-Whole Responses

For the total sample, the main variables that were significantly correlated with the children's descriptive part-whole responses (see definition, p. 5) were the children's IQs and social class level. IQs were a significant factor, also, for the boys (but not the girls) and for the middle class group. Social class level was a significant factor in the case of the girls' responses (but not the boys). In the mother-teacher stories, the mothers' mean sentence length was significantly related for the total sample and for the girls' responses. In the typical day protocols, the mothers' adjective range was significantly related for the total sample, for the girls' responses, and for the middle class group.

Syntactic structure elaboration for the upper lower class group was significantly related for all three speech samples; in the mother-teacher stories, it was significant for the ADC group; in the lion-mouse stories, it was significant for the girls and for the middle class group. Complex verb preference, in the typical day accounts, was negatively related for the three lower class groups.

Ambiguous results were obtained with respect to verb elaboration and mean sentence length as these were manifested in the different language tasks. For example, verb elaboration scores of the upper lower class mothers for the typical day protocols were positively correlated with the children's descriptive part-whole responses, but for the lion-mouse stories, their verb elaboration scoresware negatively related. (A discussion of ambiguous findings is presented later.)

Child's Descriptive Global Responses

The children's IQs were significantly correlated with their descriptive global responses for the total sample, for the boys, and, when the lion-mouse sample was the basis of the regression analysis, for the middle and upper lower class groups. With the typical day speech sample, social class level emerged as significantly related to the children's responses. The mothers' complex verb preference was significantly but negatively related for the total sample (mother-teacher protocols); for the girls' responses (mother-teacher and lion-mouse protocols); and for the ADC group (lion-mouse protocols). Adverb range was negatively related (typical day protocols) for the total sample and for the lower lower class group. Mean sentence length, stimulus utilization, introduced content, abstraction, and verb elaboration were also significantly correlated with the children's descriptive global responses, but because they were sometimes positively and sometimes negatively related, the findings require further analysis before they can be interpreted with confidence.

Child's Relational-Contextual Responses

Mean sentence length was significantly related to the girls' responses (typical day, mother-teacher protocols); for the total sample (typical day); for the middle class group (typical day); and for the ADC group (mother-teacher). The mothers' verbal IQs were significantly related to the boys' responses (lion-mouse, typical day) and to the children's responses for the upper lower and ADC groups (typical day). The children's IQs were significantly related in the case of the lower lower class group (lion-mouse, mother-teacher) and for the girls' responses (mother-teacher). Syntactic structure elaboration, verb

elaboration, adjective range, adverb range, complex verb preference, and introduced content were also significantly related but require further analysis before the relationships can be properly interpreted.

Children's Non-Verbal Responses and Non-Sorts

There was a significant tendency for children who performed the conceptual sorting task but who were unable to verbalize the basis for the sort to be low in IQ and for their mothers, also, to be low in verbal IQ. The same significantly negative relationship was found between the children's and mothers' IQs on the one hand and children's refusal or inability to make conceptual sorts. Here, the results also showed a general and marked language deficit on the part of the mothers. That is to say, various language measures were negatively correlated with high children's response failure.

CONCLUSIONS AND IMPLICATIONS

Nine language scales were developed, which when factor analyzed on three different speech samples, yielded a set of eight factors, unconfounded with verbal IQ or social class level. Thus, the language scales appear to be stable and viable measures of different aspects of language behavior. When social class comparisons were made, vast differences were found in the language of mothers of different social status. There appears to be a continuum ranging from the elaborated code of middle class mothers to the restricted code of the lower lower class groups.

When the mothers' language, verbal IQs, and social class level were examined in relation to their children's cognitive behavior, several interesting results occurred. First, social class level was a major

predictor of the children's conceptual sorting behavior in only one instance (descriptive part-whole conceptualization). Despite marked differences in mothers' language (and IQs) by social class level, when language and IQ are controlled for, social class level proved to be of only limited usefulness as a predictor of the children's cognitive behavior. Second, the mother's verbal IQ was a major predictor of only one criterion variable, the child's IQ. The ability to form concepts is a crucial element in what is commonly called intelligence. It was found that the mothers' language, not their IQ, was a better predictor of the children's conceptualizing behavior. This was most striking in the case of abstract behavior where only the mother's abstract language was significantly related to the child's abstract conceptualizing. Third, where the child's own IQ was an important factor in his conceptualizing behavior, the mother's language was at least as important, also. Fourth, children who were unable to explain verbally the reason for their conceptual sorts tended to be low in IQ and to have low verbal IQ mothers, indirect support for the view that language mediates thought. Fifth, children who did not perform the task tended to be low in IQ and to have mothers low in verbal IQ and also low in virtually all the language measures.

It was noted that although the mothers' language was significantly correlated with the children's cognitive behavior in many instances, nevertheless the relationships were not uniform across tasks and across social class levels. Accordingly, a factor analysis of all three speech samples was undertaken. This revealed a lack of <u>inter-task</u> consistency in the mothers' language behavior. The scales appear to measure language factors in a stable manner, but they do not measure language "traits,"

It seems likely that there are interaction effects between task and language style, which the methods used in this study disclosed but did not clarify. It is also possible that the discrepant results that sometimes occurred, such as positive correlations for one social class group and negative correlations for another on the same language scale, may be due to the possibility that language has differential effects at different educational levels. These are matters for further study.

Perhaps one of the most positive results of the study is that a beginning has been made at discovering the precise language mechanisms which mediate between cultural experience and cognitive behavior and development. It seems clear that language of the mother does play an important role in the socialization of her child's cognitive behavior.

Our society is constantly increasing its demand for those who have developed highly skilled and elaborate methods of processing information and manipulating the environment symbolically. Language is the most pervasive and efficacious symbol system man has yet devised. The study suggests that perhaps one effective method for enhancing the cognitive development of the culturally disadvantaged child is to take steps in the pre-school years to expand his linguistic environment and to encourage him to see the value, intrinsic as well as extrinsic, of using language as a cognitive tool.

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